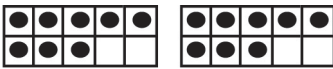


Multiplication Fact Fluency Using Doubles

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Problem Set	Tasks for Students	Prompts and Suggestions for Teachers or Tutors	Student Reasoning That May Arise
1	Double digits 5 or less and 10: 1, 2, 3, 4, 5, 10	<p><i>"Tell me, what is 'double 3'?" "What is in two groups of 4?" "How much is twice 5?"</i></p> <p>Here at the outset and throughout, minimize use of the word <i>times</i>. Help the student think in terms of two groups of a given size. Mix the facts in each set. In particular, for a fact where the student is hesitant, return to it often.</p>	Students use addition facts for doubles.
2	Double digits between 5 and 10: 6, 7, 8, 9	<p><i>"How do you think about double 6?" "What is your strategy for figuring out twice 8?"</i></p> <p>Introduce, if needed, tens frames to support student visualization. Here is $8 + 8$.</p> 	<p>Students decompose using 5 as a benchmark; they double 5 and the additional amount.</p> <p>Example: "Double 8 is double (5 + 3) or 10 + 6."</p>
3	Double multiples of 10 to 50: 10, 20, 30, 40, 50	<p><i>"How much is twice 30?" "What does 30 mean?" "How do you read [point to the symbol '30'] to say what it means?"</i></p> <p>Use language to help students focus on place-value meanings, asking, for example, what does 30 mean? [3 tens] If the student cannot say "three tens," then inform him or her and ask comparable questions as you continue.</p>	<p>Students use place-value language to explain.</p> <p>Example: "Double 30 is double three 10s, or six 10s, or 60."</p>
4	Double small numbers in early decades: 11–15, 21–25, 31–35, 41–45	<p><i>"Double 42." "What strategy can you use to figure it out?" "What does 42 mean?" "How does thinking about what it means help you double it?"</i></p> <p>If students do not do so themselves, encourage them to focus first on the 10s. The idea is to stay focused on the meaning of the numbers, not to replicate the paper algorithm.</p>	<p>Students decompose and recompose.</p> <p>Examples: "Double 43 is double 40 plus double 3, or $80 + 6 = 86$." "Double 45 is double 40 plus double 5, or 80 plus 10, or 90."</p>

Problem Set	Tasks for Students	Prompts and Suggestions for Teachers or Tutors	Student Reasoning That May Arise
5	Double multiples of 10 over 50: 60, 70, 80, 90, 100	<p><i>What is twice 90?" "What is the meaning of 90?" "What do you know that you can use?"</i></p> <p>Again, focus on place-value language: 90 is nine 10s. Students may need support in thinking about what eighteen 10s means.</p> <p><i>"What is eighteen 10s the same as?" "If you count by 10s eighteen times, where do you land?"</i></p> <p>Recognizing the equivalence of eighteen 10s and 180 is important.</p>	<p>Students use place-value language to explain.</p> <p>Examples: "Double 90 is double nine 10s, or eighteen 10s, or 180." "Ten 10s is 100, so 8 more 10s make 180."</p>
6	Double 5s in later decades: 55, 65, 75, 85, 95	<p><i>"How can you figure out twice 95?" "What does the number mean?" "How can you use the meaning?"</i></p> <p>Again, encourage students to focus first on the 10s.</p>	<p>Students decompose and recompose.</p> <p>Examples: "Double 95 is double 90 plus double 5, or $180 + 10 = 190$."</p>
7	Double large numbers in early decades: 16–19, 26–29, 36–39, 46–49	<i>"What is double 28? How can you use something you already determined to help you figure this out?"</i>	<p>Students decompose and recompose, mainly by 10s and 1s.</p> <p>Example: "Double 28 is double 20 plus double 8, or 40 plus 16. That is $40 + 10 + 6$, or 56."</p>
8	Double large numbers in later decades: 56–59, 66–69, 76–79, 86–89, 96–99	Continue as above, focusing on meanings of numbers and deriving new facts from known facts.	<p>Students decompose and recompose, mainly by 10s and 1s. Some strategies may involve subtraction from a larger multiple of 10.</p> <p>Examples: "Double 68 is double 60 + double 8, or $120 + 16$. That is $120 + 10 + 6$, or 136." "Double 68 is double 70 – double 2, or $140 - 4 = 136$."</p>